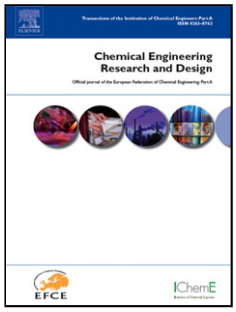


Title: On the modeling of gas-phase mass-transfer in metal sheet structured packings

Author: F.J. Rejl L. Valenz J. Haidl M. Kordač T. Moucha

PII: S0263-8762(14)00261-5
DOI: http://dx.doi.org/doi:10.1016/j.cherd.2014.06.004
Reference: CHERD 1610

To appear in:

Received date: 25-7-2013
Revised date: 29-4-2014
Accepted date: 3-6-2014

Please cite this article as: Rejl, F.J., Valenz, L., Haidl, J., Kordač, M., Moucha, T.,On the modeling of gas-phase mass-transfer in metal sheet structured packings, *Chemical Engineering Research and Design* (2014), http://dx.doi.org/10.1016/j.cherd.2014.06.004

# ON THE MODELING OF GAS-PHASE MASS-TRANSFER IN METAL SHEET STRUCTURED PACKINGS

F.J.Rejl[†], L. Valenz, J.Haidl, M.Kordač, T. Moucha

Institute of Chemical Technology Prague,

Technická 5, 166 28 Praha 6, Czech Republic

Tel.: +420 220 44 3299

e-mail: frantisek.rejl@vscht.cz

**Key words:** absorption, mass-transfer, structured packing, Mellapak

## Abstract:

This paper refers on gas mass-transfer characteristics of several metal sheet Mellapak structured packings (M250Y, M350Y, M452Y, M500Y) under absorption conditions. These characteristics have been measured using standard absorption systems of $SO_2$ chemisorption into the NaOH aqueous solution ($k_G a$) and $CO_2$ chemisorption into the NaOH aqueous solution (effective area $a$). Measurements were performed with four elements of the packing with diameter of 0.29 m and total height of 0.84 m. Gas-phase mass-transfer coefficients for all studied packings have been correlated by the dimensionless equation $Sh_G = 0.409 \cdot Re_G^{0.622} \cdot Re_L^{0.0592}$. The experimental values of $k_G$ are in the most cases significantly under-predicted by fundamental mass-transfer models, wetted-wall column correlations and by the model packages developed for structured packing. The exponent 0.622 of gas Reynolds criteria is lower than expected by the models starting from the imagination of the flow through the channel and corresponding experiments with wetted-wall columns. The revealed value of the exponent agrees better with those found for flow around submerged objects like spheres or through the bed consisting of random packing, suggesting that the wetted wall column is not a suitable experimental simplification for the study of structured packings.

[†] corresponding author